

February 14, 1974

Mr. James H. Gray
Virginia State Corporation Commission
Division of Public Utilities
P.O. Box 1197
Richmond, VA 23209

Dear Mr. Gray:

Your letter to the Office of Pipeline Safety, dated January 23, 1974, asked:

"Paragraph 192.625(f) requires the sampling of gas to assure proper concentrations of odorant which is prescribed in subparagraph(b). These requirements indicate a necessity for determining the concentration as well as the detectability. There has been considerable argument that using the number of odorant complaints, injecting a specific amount of odorant into the gas, checking only that the odor is present in the lines by sniffing the raw gas, etc., is sufficient for determine the concentration requirement. Would you please forward your opinion as to the sufficiency of the above methods and if these methods are insufficient a practical means of satisfying the requirements of this paragraph."

A regular check of the injection rate of the odorant into the gas is a good indicator that the desired level of injection is being maintained at the odorizer. This does not determine that there is a sufficient odor level throughout the system. Odorant, under certain conditions, will drop out of the gas within a piping system; thus, there can be excessive odorant in some areas and not enough in other areas at the same time. This could cause "odorant complaints" in one part of the gas system while some areas would be receiving insufficient odorant in the gas.

The language of Section 192.625, Odorization of gas, is purposely in performance terms. Paragraph 192.625(b) defines the required strength of odor; that is, detectable at a gas concentration in air of 1/5 of the lower explosive limit. Paragraph 192.625(f) requires periodic sampling of combustible gases to assure the proper concentration of odorant any where in the gas system.

Odorant is often lost from the gas due to the effect of dirt in the system, velocity of flow precipitation of odorant on the walls of new pipe installed and low humidity of the gas stream, to list a few influences. The various odorants used in gas distribution also vary widely in their

strength; therefore, the amount of odorant that should be injected in a given volume of gas cannot be given as one number for all odorants.

The most common method of checking the detectability of the gas is to create a control mixture that gives a concentration of gas in air at 1/5 of the lower explosive limit and then have various persons see if they can detect the odor. This has in the past been done using a room of known volume and releasing the correct amount of odorized gas into the space and then determine if the odor is detectable. There are also some instruments that produce a mixture of the correct concentration when connected to a gas line and actuated. The gas is then tested with the nose to see if it is detectable. Recently a new instrument has been developed that will test the concentration of the various materials in a gas sample that is used to impart an odor to gas. This is then compared with the effectiveness that was experienced in tests run with groups of people who were considered to have a normal sense of smell. If this comparison to have a normal sense of smell. If this comparison indicates sufficient strength of odor then the test is satisfactory. Other means could also be used, such as several individuals at different locations in a gas system conducting sniff tests. Any of these methods of determine detectability of the gas would be considered as acceptable if done correctly.

We trust this has answered your question. If we may assist you further, please let us know.

Sincerely,

Joseph C. Caldwell
Director
Office of Pipeline Safety